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FAT-CONTAINING BASE FOR FOOD PRODUCTS AND METHOD OF MAKING SAME

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This invention relates to a dry-to-the-touch, free flowing, readily dispersible, fat-containing base or shortening which is particularly adapted for use in the preparation of frozen desserts, candies, cakes, and other alimentary products.

The product of the present invention comprises a particle of fat encased in a dry, soluble coating of a homogeneous mixture of gelatine and sugar. The gelatin-sugar mixture forms a protective coating for the fat particle and, being readily soluble in cold water or cold aqueous mixtures, releases and disperses the fat particle in these media when introduced therein, and maintains the same in a relatively stable state of suspension.

The fat-containing base of the present invention may be made by forming an emulsion of the fat, gelatin and sugar, adjusting the pH of the emulsion as hereinafter described, and then drying the emulsion as by spray drying or other conventional drying procedures.

The fat-containing base of the present invention simulates a dry powder. It is not greasy or oily to the touch, has very little tendency to aggregate in the absence of moisture, and is extremely easy to handle. It may be placed in ordinary containers used for the packaging of food products such as sugar or salt; it may be readily transferred from one container to another without loss due to adhesion to the walls of the container; and it may be poured from the container like sugar or salt.

The fat-containing base or shortening of the present invention has very little tendency towards rancidity even in the absence of refrigeration and has a relatively long shelf life over the wide range of temperature and moisture conditions encountered in this country. It appears that the shell or casing of the gelatin-sugar mixture about the fat particle protects the same from the factors responsible for the normal deterioration of unprotected fat, to an extent perhaps even greater than that obtained when the fat is protected in accordance with standard procedures. Food products made with the base of the present invention are wholesome and palatable.

When the coated fat particles of the present invention are stirred in water or in an aqueous solution or dispersion, the fat contained therein is dispersed in these media with great rapidity and ease and with great uniformity, perhaps even greater than the best of the coated fat particles heretofore known to the prior art. The fat-containing base may be readily incorporated into dry mixtures with any common type of blender and the blending temperature is not critical as with the blending of plastic fats or oils.

The appearance of dry mixes containing our product are more appealing to the eye than are mixes containing plastic fats and oils. This increases the salability of the mix. In addition, our product enhances the stability, body, texture and eating qualities of frozen desserts and other food products made therewith.

In the description to follow, all parts given are parts by weight. Similarly, percentages indicated are percentages by weight.

In making the shortening of the present invention, proportions of the constituents may be varied rather widely. To make the product in accordance with our preferred procedure, we first make an emulsion of fat, sugar and gelatin, the pH of the emulsion being adjusted as described below. In preparing the emulsion, the fat, sugar and gelatin are mixed together, dry or with water, and then sufficient water is added to obtain a fluid, free-flowing emulsion.

In the emulsion, the amount of fat may vary, for example from between about 3% to 60%. The amount of sugar (dry), which preferably is roughly inversely proportional to the amount of fat used, may vary between about 20 to 75%. The gelatin (dry) should be between about 0.25 to 2% by weight of the final emulsion. Preferred proportions of the ingredients in the emulsion are:

	Percent
Fat	25 to 35
Sugar (dry)	40 to 50
Gelatin (dry)	1
Water	20 to 30

After the emulsion is made, it is homogenized and then dried according to conventional procedure, for example spray drying, pan drying, or drum drying. When the dried product is placed in water, the pH closely approximates the pH of the emulsion.

The constituents of the dried product may vary rather widely, for example in the approximate ranges indicated below:

	Percent
Fat	70 to 4
Sugar	25 to 95
Gelatin	0.3 to 2.4

We prefer the following proportions in the dried product.

	Percent
Fat	40 to 60
Sugar	57 to 37
Gelatin	1

The fat used may be any edible animal or vegetable fat or mixtures of such fats. They may be solid, semi-solid or liquid fats. Examples of fats which are suitable for use in the present invention are beef fat, pork fat, lamb fat, butterfat, soybean oil, cottonseed oil, peanut oil, coconut oil, sesame seed oil, sunflower seed oil, sardine oil and other fish oils. Fat-containing materials such as egg yolks may also be employed.

The sugar may be any edible, cold water soluble sugar such as dextrose, fructose, lactose, sucrose or maltose. Combinations of suitable sugars may also be employed. We prefer to use sugar in the form of corn syrup, particularly corn syrup in which the percentage of reducing sugars, calculated as dextrose, is low. For example, a corn syrup having a value of 24% reducing sugars calculated as dextrose is highly desirable since such a sugar is not hygroscopic and the product will not cake or become lumpy when packaged.

Gelatin from either an acid treated precursor (acid type), such as pork skin gelatin, or an alkali treated precursor (alkali type), such as bone gelatin or calf skin gelatin, may be used. The acid type gelatin generally has an isoelectric point between pH of about 7 to 9, usually about 8. The alkali type gelatin usually has an isoelectric point between pH of about 4.7 to 5.2. We have found that in making the product of the present invention, the stability of emulsion is greatly increased if the pH of the emulsion is maintained substantially outside the isoelectric point of the gelatin. Thus, with the acid type gelatin, the pH of the emulsion should be adjusted preferably between about 2 to 4.3. At a pH higher than about 4.5, the emulsion tends to become unstable. With the acid type gelatin, to remove the pH from the isoelectric point on the alkaline side, so as to stabilize the emulsion, requires a pH of about 11 or so and such a high pH will result in objectionable soapiness and, frequently, offensive odors which are undesirable in a food product. In consequence, adjustment of the pH of an acid type gelatin to a pH on the alkaline side is not a preferred practice in accordance with the present invention.

With the alkali type gelatin, the pH of the emulsion must be maintained on the acid side between pH of about 1 to 3, preferably about 1. Alkali type gelatins can also be used at an adjusted pH of about 6 to 8 or higher, but again if the pH becomes too alkaline, saponification and offensive odors frequently occur. We prefer to use the acid type gelatin.

Any edible acid may be used to lower the pH below the isoelectric point. We prefer to use a dry crystalline acid such as tartaric acid, malic acid, citric acid or phos-